

Goldgeisser et al  
Application No.: 09/993,191  
Page 2

PATENT  
Attorney Docket No. 005-1

AMENDMENT TO THE CLAIMS:

LISTING OF CLAIMS:

5                   This listing of claims replaces all prior versions, and listings, of claims in the  
referenced application.

Claims 1-5 cancelled.

1                   Claim 6. (Currently amended, Allowable)) A tri-stable CMOS latch, having  
2   first and second inputs for receiving first and second input signals, respectively, where the  
3   first and second input signals have first and second signal levels, respectively, and with  
4   combinations of the signal levels of the first and second input signals defining first, second,  
5   and third ternary logic states, said tri-stable CMOS latch ternary logic signals in either a first,  
6   ~~second, or third state~~, comprising:  
7                   a first series circuit coupling first and second supply voltage terminals, with  
8   the first series circuit including a first PMOS transistor, including source, drain, and gate  
9   terminals coupling the first supply voltage terminal to a first node, a first biasing element  
10   coupling the first node to a second node, and a first NMOS transistor, including source, drain,  
11   and gate terminals coupling the second node to the second supply voltage terminal;  
12                  a second series circuit coupling the first and second supply voltage terminals,  
13   with the second series circuit including a second PMOS transistor, including source, drain,  
14   and gate terminals coupling the first supply voltage terminal to a third node, a second biasing  
15   element coupling the third node to a fourth node, and a second NMOS transistor, including  
16   source, drain, and gate terminals coupling the fourth node to the second supply voltage  
17   terminal;  
18                  a feedback network coupling the first node to the gate terminal of the second  
19   NMOS transistor, the second node to the gate terminal of the second PMOS transistor, the  
20   third node to the gate terminal of the first NMOS transistor, and the fourth node to the gate  
21   terminal of the first PMOS transistor;  
22                  with said first and second biasing elements, and said MOS transistors  
23   fabricated utilizing MOSFET technology, where said first and second biasing elements are  
24   diode-connected transistors, and with the first and second biasing elements creating unequal

Goldgeisser et al  
Application No.: 09/993,191  
Page 3

PATENT  
Attorney Docket No. 005-1

25 voltage drops to bias the PMOS and NMOS transistors in one of the first and second series  
26 circuits in a higher-current state and the PMOS and NMOS transistor of the other of the first  
27 and second series circuits in a lower-current state to achieve first and second stable operating  
28 points when first and second input signals having signal levels defining a ternary signal in the  
29 first or second ternary state are is received and creating substantially identical voltage drops  
30 to bias the PMOS and NMOS transistors in both the first and second series circuits in triode  
31 mode to achieve a third stable operating point, where the first and second PMOS and NMOS  
32 transistors conduct substantially the same current, when first and second input signals having  
33 signal levels defining a ternary logic signal in the third ternary state are is received.

1 Claim 7. (Thrice amended, Allowable) A MOS circuit comprising:  
2 a current source;  
3 a first clocking transistor having source, drain, and gate terminal with said  
4 source terminal coupled to the current source, where the first clocking transistor conducts  
5 when a first control signal, received at said gate terminal, is asserted;  
6 a tristable MOS latch including:  
7 first and second inputs for receiving first and second input signals,  
8 respectively, where the first and second input signals have first and second signal  
9 levels, respectively, and with combinations of the signal levels of the first and second  
10 input signals defining first, second, and third ternary logic states ~~ternary logic signals~~  
11 ~~in either a first, second, or third state;~~  
12 a first series circuit coupling a first supply voltage terminal to the drain  
13 terminal of said first clocking transistor, with the first series circuit including a first  
14 load element coupling the first supply voltage terminal to a first node, a first biasing  
15 element coupling the first node to a second node, and a first MOS transistor, including  
16 source, drain, and gate terminals coupling the second node to the drain terminal of  
17 said first clocking transistor;  
18 a second series circuit coupling a first supply voltage terminal to the  
19 drain terminal of said first clocking transistor, with the second series circuit including  
20 a second load element coupling the first supply voltage terminal to a third node, a  
21 second biasing element coupling the third node to a fourth node, and a second MOS

Goldgeisser et al  
Application No.: 09/993,191  
Page 4

PATENT  
Attorney Docket No. 005-1

22 transistor, including source, drain, and gate terminals coupling the fourth node to the  
23 drain terminal of said first clocking transistor;  
24 a feedback network coupling the first node to the gate terminal of the  
25 second MOS transistor and third node to the gate terminal of the first MOS transistor;  
26 with said first and second load elements, said biasing elements, and  
27 said MOS transistors fabricated utilizing MOSFET technology and with the first and  
28 second load and biasing elements creating unequal voltage drops to bias one of the  
29 MOS transistors in a higher-current state and the other MOS transistor in a lower-  
30 current state to achieve first and second stable operating points when first and second  
31 input signals having signal levels defining a ternary signal in the first or second state  
32 are is received and creating substantially identical voltage drops to bias the MOS  
33 transistors in triode mode to achieve a third stable operating point, where the first and  
34 second MOS transistors conduct substantially the same current, when first and second  
35 input signals having signal levels defining a ternary logic signal in the third state are  
36 is received;  
37 a second clocking transistor having source, drain, and gate terminal with its  
38 source terminal coupled to the current source, where the second clocking transistor conducts  
39 when a second control signal, received at said gate terminal, is asserted;  
40 an input circuit including:  
41 first and second circuits respectively coupling the first and third nodes  
42 to the drain terminal of the second clocking transistor, with the first circuit including a  
43 first input transistor having source, drain, and gate terminals, the first input transistor  
44 coupled to the first input to receive a first input signal at said gate terminal and with  
45 the second circuit including a second input transistor having source, drain, and gate  
46 terminals, the second input transistor coupled to the second input to receive a second  
47 input signal at said gate terminal;  
48 where the tristable latch holds any of the first, second, or third states applied to  
49 the inputs when the first control signal is asserted and the second control signal is not  
50 asserted.

1 Claim 8. (Withdrawn)

MAR-15-2004 20:41

LAW OFFICE OF CEK

925 944 3363

P.06/08

PATENT

Attorney Docket No. 005-1

1

Claim 9. (Cancelled).